

There's something wrong with our computer systems. Much of our time is filled with frustration – websites and intranets that don't let us find the information we want, word processors that lose hours of work with a click of the mouse, remote controls that have more buttons than we could possibly need.

'Usability' is widely seen as the answer to many of these frustrating interactions with technology. There are usability books, websites, guidelines and checklists, so why are products and systems getting harder to use instead of easier?

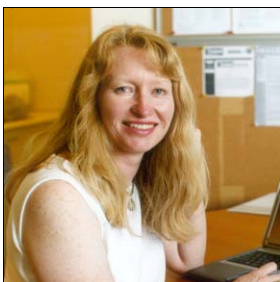
There is some confusion about what usability is and whether businesses are 'doing usability' or not. There are many aspects to usability – more than just running a usability test at the end of a project.

This article provides an overview of what usability is (and what it is not). It provides ideas on how to include more usability activities in projects and the types of activities that are needed in order to create more usable systems.

What is usability?

'Usability' is an umbrella term that encompasses two related concepts:

1. Usability is an attribute of the quality of a system:
"We need to create a usable intranet"
2. Usability is a process or set of techniques used during a design and development project:
"We need to include usability activities in this project"



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This second aspect is sometimes described as usability engineering, and is more accurately described as user-centred design.

'Usability' refers to the quality of a system and the process of designing a usable system

Usable – Usability as quality

There are a number of definitions for the quality aspect of usability, including this one from ISO 9241-11:

"the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use."

This definition includes four elements that are necessary to create a usable system:

3. There are specified users of the system.
4. The users have a set of specified goals.
5. The system should allow user goals to be met (effectively) in an efficient manner and the users will be satisfied with the process or outcome.
6. The system will be used in a particular context (e.g. within a physical location, a business process).

A usable system is one that is designed to consider all of these aspects.

Why is usability important

A highly usable system offers benefits to both users and business.

The primary benefits to users are that they are able to achieve their tasks easily and efficiently. This sounds simple, but the feeling of achievement that people get when they use a computer system without frustration should not be underestimated.

Unusable systems can result in *substantial* costs to the business, not just in terms of lost

sales, but in customer satisfaction, staff productivity and support requirements.

People will go to great lengths to avoid using difficult systems

Systems that are difficult to use result in the following business costs:

- If the system is difficult to use, people won't use it.

Whenever a choice is available, people will take the easiest option. This is particularly common on websites, where there is choice and a wide variation in usability. If people can't find a product on your website, they will do so somewhere else.

The alternative may not be another system, but another method or format. If people have a choice between a simple, familiar paper form and a difficult online form, it is easy to see why they would continue with the paper version. Potential business benefits associated with the online form (including reduced processing costs) are not realised.

- If people have to use a difficult system, they will do so as little as possible.

When people are given no alternative but to use a difficult system (such as a core business application or a standard word processing package), they will go to great lengths to avoid using the system. They will create elaborate work-arounds, put a lot of effort into finding ways to avoid using the system and will share this information with others.

For example, on difficult business systems, people fill in as few fields as they can, and put dummy data in those that they can't avoid (causing poor data quality and increasingly strict measures or training efforts to improve quality). On a difficult intranet, people print out large documents or email them to colleagues so they don't have to look for them again, defeating the purpose of the intranet as a place for accurate and up to date information.

- If people have to use a difficult system, they will waste time.

Where work arounds are not possible, a difficult system will cause staff to be inefficient for a longer time than necessary. It will take them time to learn how to use the system and any task that they don't do frequently will take longer and result in more errors.

- More support is necessary

A system that is difficult to use requires much more support than an equivalent easy to use system. The need for documentation, training and help desk support is higher.

- More changes are necessary

If user needs were not considered when determining requirements (functionality is missing) and user abilities were not considered when designing the system the system is likely to require more changes and enhancements.

The only way to tell if a system is usable is to watch people using it

How to tell whether a system is usable

The only way to determine whether a system is usable is to get end users to use it for real tasks.

The main way this is done is through *usability testing*. In a usability test, users of the system attempt tasks while being observed. The observers don't tell the usability test participant how to use the system and don't answer questions – it is as if the participant were doing the tasks alone.

The usability test identifies the key usability problems with a system (which enables them to be fixed); and/or collects quantitative measures of efficiency, effectiveness and satisfaction before release.

The key aspects of a usability test are:

- Participants involved are existing or future users of the system.

It is important to involve the right people in a usability test. For example, for a business system the day-to-day users should be involved, not their managers.

- Participants attempt tasks that they would normally perform on the system.

It is crucial that the tasks that are included in the test be realistic. They must also describe the entire task and be written to remove bias.

- The usability test is set up in a way that is as close to the normal context as possible.

The usability test may be conducted at the participants desk or in their home if the location is relevant. Alternatively, a usability test may be conducted in a usability lab, an office or a meeting room. The equipment used should be similar to the user's normal equipment.

Demonstrating the system does not identify whether it is usable

How not to tell if a system is usable

There are a number of methods in use that aim to gather feedback about a system. However, unless they involve end users using the system to complete tasks, they will not tell you whether a system is usable:

- Demonstrating the system

Showing a system to users and asking for their feedback is a good way of getting their involvement in a project, but does not provide information on whether it is usable. This method only collects opinions or personal preferences. In most cases people will mention things that do not end up being problems and will fail to identify things that are problems.

- Surveys

A survey can collect people's opinions on a system and might provide some interesting feedback. Respondents may be able to report on problems with the system or changes that they need, however, usability problems can be subtle. It is difficult to know why problems occur without observing people using the system.

- Asking another system developer

The designer or developer of a similar system may be able to give you some ideas about usability. However, unless they are going to be a user of the system, they are likely to be different to the real user group. For example, they are likely to know more about the technology and less about the subject than the end users.

- Asking a usability expert

A usability expert should be able to give you ideas on likely usability issues based on experience observing people using similar systems. However, almost all experts miss issues that occur for end users of systems. An expert may not know the tasks that need to be completed and may know more about the technology than the users. A good expert will tell you this before offering an opinion.

Usability checklists, guidelines and standards

Usability checklists, guidelines and standards can be useful to provide ideas about usability issues, but they must be assessed to determine whether they are relevant to the users and context.

As an example, a common website guideline is that all content should be available within three clicks. The intent of this guideline is good – it highlights that people should not have to click endlessly for information. However, there are situations where it is not applicable. Large sites or sites with information designed to present increasingly detailed pages may not meet the guideline, but may be very usable for the intended audience.

Guidelines and standards are best used to identify the most obvious usability problems and fix them before a usability test is conducted.

Checklists and guidelines should be used to identify usability problems before testing

How to create a usable system

The best way of ensuring that the system is usable is to follow a user-centred design process (outlined below), where users are considered and involved in the process, and usability testing is carried out at many stages of the design process.

Learn about people, design for the user group, work with the users

User centred design

User centred design is a process or set of techniques that can be used to create a usable system. User centred activities can be included throughout the design and development process, from concept development to final testing and beyond into support and maintenance.

User centred design is not a step by step magic methodology. It is closer to a philosophy or way of looking at the world. It is about genuinely wanting to create something that can be used by the real audience and about remembering that the system is not for the team creating it.

User Centred Design involves three key aspects:

7. learning *about* human abilities and limitations
8. designing *for* a particular group of people
9. working *with* these people throughout the design process

It does take time to learn about the user group and may need some specialist skills to ensure that the design matches human abilities and limitations. However, the time and effort will be more than offset during the design and development process. The focus on user abilities and needs means that the team has a much clearer picture of the requirements from the start. A good understanding of needs, and regular involvement of users also means that usability issues are identified early enough to fix them.

Learn about human abilities and limitations

About – Learning about people

The ability to design systems that are usable for people requires an understanding of human abilities and limitations. The key characteristics relevant for many everyday systems are outlined below, but there are many more that will vary depending on the audience and system.

- Memory

Everyone jokes about how bad their memory is. The human memory does have many limitations that affect our everyday life. For example, we have limited capacity in working memory, have to rehearse to store in long term memory and remember better if we practice.

Usable systems minimise the amount that we need to memorise. This may involve displaying relevant information at appropriate points, providing comparison charts or providing flexible password options.

- Error

It is a fact of life that people make errors. That users will make errors is one of the most predictable parts of systems design. A characteristic of a usable system is that it is designed to be tolerant of errors. This can be done by acknowledging that errors will occur, preventing those that are possible and allowing easy recovery from those that do occur.

- Perception

Perception relates to the way that people acquire and organise sensory information. It involves the acquisition of information through the classic five senses (sight, hearing, smell, taste, touch) plus proprioception (body awareness) and equilibrioception (balance).

Sight is the primary sense used in many situations and the one that is most relevant for the design of computer-based systems.

Usable systems recognise our perceptual abilities and limitations and allow us to use the sense that is best suited to tasks.

- Decision making

People believe that decisions are made in a logical way – that we evaluate options and make rational decisions. In practice, most decisions are not made this way. Instead, we often satisfice – accepting the first reasonable answer that fits the situation.

Designers of systems that help people to make decisions (such as information systems) must recognise that people are likely to use the first piece of information they see, may not read beyond that, and are very unlikely to read disclaimers or additional information.

- Information seeking behaviour

Most information seeking behaviour is one of two types:

- Known-item: when people will know exactly what information they are looking for, know that it exists and know how to describe what they are looking for.
- Exploratory (unknown item): when people are not sure what information they are looking for, may not know how much information there is and do not know how to describe what they want.

Some methods of information retrieval suit some tasks better than others, requiring an understanding of how people will approach a particular set of information.

- Mental models

One way that people make sense of the world is to form a mental model of how things work. The mental model changes over time with experience, but it may never be accurate.

An understanding of users' mental models can provide useful input to the way a system is designed. The mental model of users can be used to guide the design and increase the chance of people being able to use it.

A system is used by a group of people – learn what they need

For – Designing for the users

The second aspect of user centred design is that it is about a particular set of people – the current or future users of the system. To design a usable system, it is crucial to gain a good understanding of who will be using the system. It is also important to articulate this so that the knowledge about the user group is available to relevant stakeholders.

Who are the users?

For many systems, it is easy to determine who the users are. For example, most business applications are created for a specific purpose with a limited audience. However, there are cases when it can be more difficult – many government websites are designed for 'the Australian population' without considering what this really means.

If you don't know who the users of an existing website are, do some initial analysis of site statistics, search logs and referrer logs or run a short survey to find out who is using the site before undertaking some of the following steps to learn more about them.

Learn what the users need by observing them, not asking them

Learning about users

Once you know who the users are, there are a range of ways to learn more about them and what they need from the system.

The most useful techniques involve observing people and talking with them about their tasks, as opposed to asking them what they need. Asking directly is usually misleading – people describe features they have already seen or used and are unlikely to know what possibilities exist. In addition, when asked to describe how a task is done, people usually describe the way it *should* be done – observing them shows how it is *actually* done.

- Interviews

Interviews involve one-on-one discussions with users of the system. They are good to identify key needs and uncover important issues. They are conducted in the user's normal context and are useful for gaining practical information.

- Task analysis

Task analysis is used to break down the tasks people will perform with the system. It identifies goals of the tasks, the steps involved, inputs, outputs and information needs.

- Contextual enquiry

Contextual enquiry involves observing people undertaking their normal tasks. The key difference between this and interviews is that contextual enquiry focuses more on observing the task and less on discussing how it is done.

- Focus groups

A focus group is a facilitated discussion used to elicit attitudes, feelings and ideas about a particular topic. It is useful to gain ideas about issues early in the system design process. It is best conducted with small groups (6-8 people) who are or will be users of the system.

- Surveys

Surveys and questionnaires are an efficient way to gain input from a large number of people. They are best suited to gathering opinions rather than specific information about tasks. To ensure that the results are valid, care must be taken when developing the survey and analysing the results.

Share user research outcomes so everyone can focus on the users

Communicating user needs

It is important to communicate the characteristics and needs of users to other people so that everyone can focus on user needs.

- Personas

Personas are fictitious users that represent the needs of specific user groups. They are used to guide design activities and to communicate about users to other stakeholders. They are created as a result of user research activities.

For more information, see our article “An introduction to personas and how to create them” at www.steptwo.com.au/papers/kmc_personas/

- Scenarios

Scenarios are short stories that describe how users complete tasks within a particular context. They can be used to inform the design process and communicate about tasks that people do. They are also used during usability testing.

- Task lists

Task lists are simple listings of all of the tasks that users will want to do with the system. They are most suited to systems that involve a large number of discrete tasks such as informational sites. They may include the types of information that are needed to complete the tasks.

Involving users throughout the process results in fewer usability problems at the end

With – Working with users

The third aspect of user centred design is involving the users throughout the design process. There are many ways that this can be done, from concept design to implementation and beyond.

In the early stage of a system design process, the techniques discussed above are most appropriate. Using these techniques ensures that you gain a good understanding of what the system needs to do.

Further into the system design process, other ways to involve users include:

- Collaborative design

Collaborative or participatory design involves business representatives, designers, developers and users working together to design the system. It is a good way to involve users throughout the process, but needs to be managed carefully. With too much exposure, the users involved can become experts in the system and fail to represent the user group. Collaborative design sessions are to learn more about user tasks and how the system will support them, not to get users (who are not experienced designers) to do the design.

- Design walk-throughs

Design walk-throughs are used to check design decisions and collect feedback on an early version of a design (a version that is too early to usability test). It involves walking through the design using real scenarios and discussing actions and aspects of the interface.

- Card sorting

Card sorting is a quick, simple technique used as input to the structure of an information system such as a website. Users are provided with a list of potential content (written on index cards) and asked to sort them into groups.

- Free listing

Free listing is a technique that is used in group sessions. Participants are provided with a topic and the group has to come up with as many examples for the topic as possible. For example, the group may be asked to list as many business forms as they can. It provides insight into items that are related and the words people use to describe the topic. It is useful as input to the content and labelling for information systems.

- Prioritisation sessions

In a prioritisation session, users are provided with lists of new functionality and content and asked to sort them in various ways. They can sort them according to usefulness, how often they would use the function or how quickly they need to access it. This is a practical way to prioritise requirements.

- Paper prototyping

Paper prototyping involves creating mock-ups of the system screens with enough detail to demonstrate the system. Users work through scenarios on the system while a facilitator shuffles screens. Paper prototypes are best hand drawn (rather than computer drawn) so participants can tell that they are still under development.

- Usability testing

Usability tests should be conducted throughout the design cycle, first on paper or early computer prototypes, then on a more complete system. This will help to identify usability issues as they arise – it is much easier to make changes to early designs than a final system.

Small, frequent usability tests provide much better value than one large usability test.

Conclusion

Usable systems deliver substantial benefits for business and users. A system that allows people to complete their tasks easily, quickly and without frustration will save time and money for the business and allow business goals to be met.

It is possible to create usable systems – by considering human abilities and limitations, learning about the needs of the user group and involving the users throughout the design process. Taking these steps may involve a little more effort in the early stages of the process, but ensures that the end result is going to be more useful and more usable, and therefore used.



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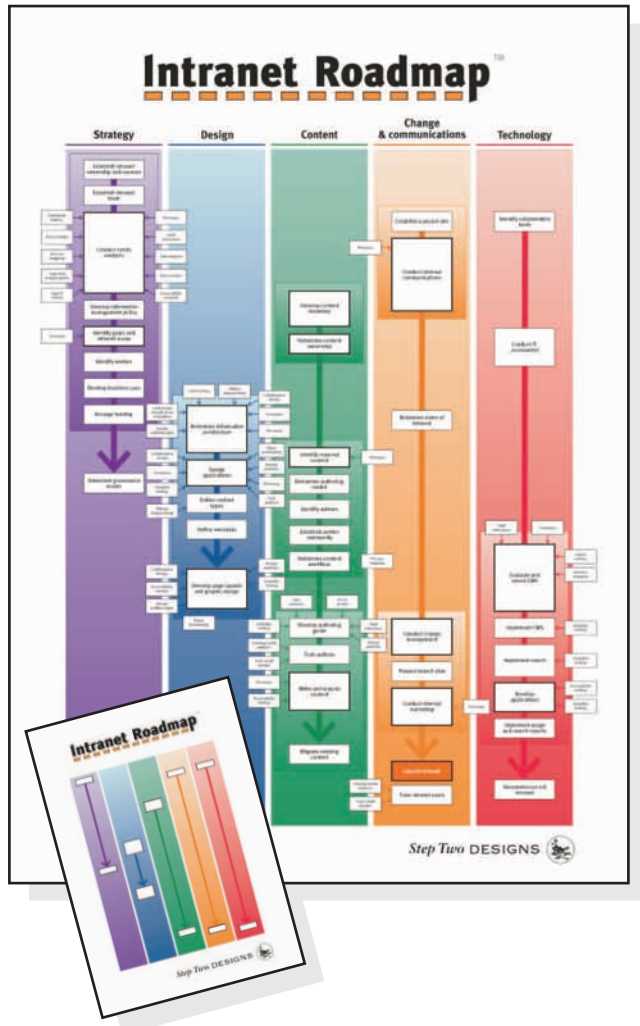
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Intranet Roadmap™



The **Intranet Roadmap™** provides the first truly comprehensive methodology that describes all the activities required to develop (or redevelop) an intranet.

Beyond just implementing software or redesigning the site, the Intranet Roadmap covers activities in five key streams:

- **strategy**
- **design**
- **content**
- **change & communications**
- **technology**

The Intranet Roadmap does more than just indicate what activities need to be conducted, it clearly shows the sequence of activities required, and the techniques that will help at every stage of the project.

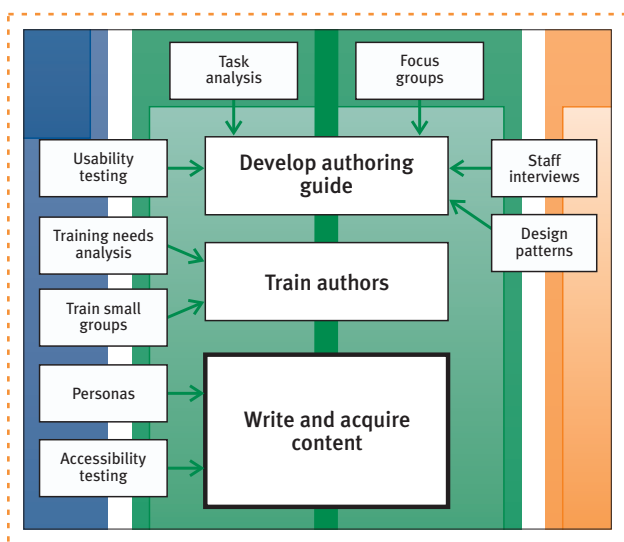
The Intranet Roadmap is delivered in two forms:

- **full colour A1 wallchart**
- **supporting 54 page booklet**

The **wallchart** lists the key activities required in each of the project streams. It also highlights which activities (such as usability testing, affinity diagramming, personas and collaborative design) can be used to support individual activities.

The supporting **booklet** then provides an overview of every activity and technique listed on the Intranet Roadmap, as well as linking to further resources and information.

The combination of the wallchart and booklet will be invaluable for any team looking to develop or redevelop an intranet, and it will assist in both planning and reviewing the approach taken.



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